

Report to the National Advisory Environmental Health Sciences Council
Director, NIEHS
February 19, 2009

Dr. Linda Birnbaum entered on duty as Director, National Institute of Environmental Health Sciences, on January 18, 2009.

Director's Message

It is my pleasure and privilege to address you on the occasion of my initial meeting with the National Advisory Environmental Health Sciences Council. I am proud to be entrusted with the leadership of this great institute, and I am hoping that with your help and with the efforts of all of us – our top notch scientists and staff, and our outstanding extramural community – we can move beyond the turbulence of the recent past and advance our mission at a time in scientific history that has never been more exciting and full of promise.

The challenges to the field of environmental health sciences in the 21st century are enormous. As biological sciences generate a deeper understanding of the working of organisms at the molecular and systems levels, so opportunities open for us to advance our knowledge of the effects of environmental exposures and to understand both the robust and the subtle, complex ways in which exposures affect human health and disease. Tackling scientific questions with this level of complexity will require an ongoing evaluation of our ideas and approaches and an emphasis on integration across disciplines: computational and molecular to clinical and public health, and everything in between. We also have a responsibility as an institute to empower efforts to translate our discoveries into improvements in public health and clinical practice.

Over the coming months, I will be emphasizing “evolution, not revolution”, as I come up to speed regarding my knowledge of current NIEHS programs, organization, and issues. I am eager to have the Council's advice and input as we move forward. I view the Council as an invaluable resource, with a wealth of knowledge both about the NIEHS and about the state of environmental health sciences in general, and also as an outside point of view with which to compare and check my own impressions. I hope to be able to have an open, honest dialog with this group, and will always welcome your opinions and insight.

I also want to extend my deep appreciation, for myself and on behalf of the entire NIEHS community, to Drs. Sam Wilson and Bill Suk for their leadership of NIEHS over the past seventeen months.

Recent Scientific Advances

1. Pope CA 3rd, Ezzati M, Dockery DW. Fine-particulate air pollution and life expectancy in the United States. N Engl J Med. 2009 Jan 22;360(4):376-86. [HTML PDF](#)

2. Navas-Acien A, Silbergeld EK, Pastor-Barriuso R, Guallar E. Arsenic exposure and prevalence of type 2 diabetes in US adults. *JAMA*. 2008 Aug 20;300(7):814-22. [HTML](#) [PDF](#)
3. Stevens RC, Suzuki SM, Cole TB, Park SS, Richter RJ, Furlong CE. Engineered recombinant human paraoxonase 1 (rHuPON1) purified from *Escherichia coli* protects against organophosphate poisoning. *Proc Natl Acad Sci U S A*. 2008 Sep 2;105(35):12780-4. [HTML](#) [PDF](#)
4. Chuang KJ, Coull BA, Zanobetti A, Suh H, Schwartz J, Stone PH, Litonjua A, Speizer FE, Gold DR. Particulate air pollution as a risk factor for ST-segment depression in patients with coronary artery disease. *Circulation*. 2008 Sep 23;118(13):1314-20. [HTML](#) [PDF](#)
5. Chou AP, Maidment N, Klintenberg R, Casida JE, Li S, Fitzmaurice AG, Fernagut PO, Mortazavi F, Chesselet MF, Bronstein JM. Ziram causes dopaminergic cell damage by inhibiting E1 ligase of the proteasome. *J Biol Chem*. 2008 Dec 12;283(50):34696-703. [HTML](#) [PDF](#)
6. Straub AC, Clark KA, Ross MA, Chandra AG, Li S, Gao X, Pagano PJ, Stolz DB, Barchowsky A. Arsenic-stimulated liver sinusoidal capillarization in mice requires NADPH oxidase-generated superoxide. *J Clin Invest*. 2008 Dec;118(12):3980-9. [HTML](#) [PDF](#)
7. Williams MA, Rangasamy T, Bauer SM, Killedar S, Karp M, Kensler TW, Yamamoto M, Breyse P, Biswal S, Georas SN. Disruption of the transcription factor Nrf2 promotes pro-oxidative dendritic cells that stimulate Th2-like immunoresponsiveness upon activation by ambient particulate matter. *J Immunol*. 2008 Oct 1;181(7):4545-59. [HTML](#) [PDF](#)
8. Waalkes MP, Liu J, Germolec DR, Trempus CS, Cannon RE, Tokar EJ, Tennant RW, Ward JM, Diwan BA. Arsenic exposure in utero exacerbates skin cancer response in adulthood with contemporaneous distortion of tumor stem cell dynamics. *Cancer Res*. 2008 Oct 15;68(20):8278-85. [HTML](#) [PDF](#)
9. Hartz AM, Bauer B, Block ML, Hong JS, Miller DS. Diesel exhaust particles induce oxidative stress, proinflammatory signaling, and P-glycoprotein up-regulation at the blood-brain barrier. *FASEB J*. 2008 Aug;22(8):2723-33. [HTML](#) [PDF](#)
10. Donohue KM, Al-alem U, Perzanowski MS, Chew GL, Johnson A, Divjan A, Kelvin EA, Hoepner LA, Perera FP, Miller RL. Anti-cockroach and anti-mouse IgE are associated with early wheeze and atopy in an inner-city birth cohort. *J Allergy Clin Immunol*. 2008 Nov;122(5):914-20. [HTML](#) [PDF](#)
11. Brown KH, Schultz IR, Cloud JG, Nagler JJ. Aneuploid sperm formation in rainbow trout exposed to the environmental estrogen 17{alpha}-ethynylestradiol. *Proc Natl Acad Sci U S A*. 2008 Dec 16;105(50):19786-91. [HTML](#) [PDF](#)

12. Wallace K, Kelsey KT, Schned A, Morris JS, Andrew AS, Karagas MR. Selenium and risk of bladder cancer: a population-based case-control study. *Cancer Prev Res (Phila Pa)*. 2009 Jan;2(1):70-3. [HTML](#) [PDF](#)
13. Perera F, Li TY, Zhou ZJ, Yuan T, Chen YH, Qu L, Rauh VA, Zhang Y, Tang D. Benefits of reducing prenatal exposure to coal-burning pollutants to children's neurodevelopment in China. *Environ Health Perspect*. 2008 Oct;116(10):1396-400. [HTML](#) [PDF](#)
14. Garantziotis S, Li Z, Potts EN, Kimata K, Zhuo L, Morgan DL, Savani RC, Noble PW, Foster WM, Schwartz DA, Hollingsworth JW. Hyaluronan mediates ozone-induced airway hyperresponsiveness in mice. *J Biol Chem*. 2009 Jan 21. [Epub ahead of print] [PDF](#)

Institute Highlights and Milestones

- “Genetic Susceptibility to Air Pollution Outcome Models: Approaches to Translation of Cariopulmonary Animal Disease Models,” workshop focused on improving research related to susceptibility to respiratory and cardiovascular outcomes, held at NIEHS Sept. 4-5, 2008.
- Cincinnati Town Meeting: “Your Home, Your Health, Your Voice,” hosted by NIEHS and University of Cincinnati, Sept. 15, 2008.
- NIEHS, with NIDA, NIDDK, and OPASI, announced Sept. 29, 2008, funding for the new NIH Roadmap Epigenomics Program that will invest more than \$190 million over the next five years to accelerate this emerging field of biomedical research.
- NIEHS announced on Sept. 16, 2008, that it will award three new grants totaling \$21.25 million over a five-year period to study how environmental factors contribute to the cause, prevention and treatment of Parkinson’s Disease and related disorders.
- NIEHS chaired organizing committee and co-chaired workshop: “Environmental risks of respiratory disease”. Indo-US Joint Working Group on Environment and Occupational Health. Chandigarh, India. September, 2008 (Co-sponsored by NIEHS, NICHD, CDC, EPA, American Thoracic Society, Health Effects Institute and the Indian Council for Medical Research)
- NIEHS organized and chaired workshop in Bethesda MD (NIH campus) entitled “Environmental Systems of Public Health” cosponsored by NIEHS, NICHD, OBSSR and NCI. September 2008.
- NIEHS co-sponsored International Environmental Nanotechnology Conference: Applications and Implications was cosponsored by the NIEHS Superfund Basic Research Program, Oct. 7-9, 2008.
- Implications for Safety and Health Training in a Green Economy, a workshop sponsored by the NIEHS Worker Education and Training Program, Oct. 16-17, 2008.
- Central and Eastern European Conference on Health and the Environment: The Environment – A Platform for Health, a workshop cosponsored by the NIEHS Superfund Basic Research Program, Oct. 19-22, 2008, in Cluj-Napoca, Romania.
- P30 Core Center Director’s Meeting, Oct. 19-21, 2008, a meeting of the leadership of the twenty Environmental Health Sciences Core Centers from around the nation, to discuss

gene-environment interactions with regard to emerging research, disease risk, and public health.

- Dioxin Toxicity: Mechanisms, Models, and Potential Health Risks, a NIEHS SBRP cosponsored event, Oct. 20-21, at Michigan State University.
- 5th Annual Early Exposures Meeting, a conference on the emerging topics in breast cancer and the environment research conducted at NIEHS co-sponsored centers, Nov. 13-14, 2008, in Birmingham, Alabama.
- Expert Panel on Cobalt-Tungsten Carbide Powders and Hardmetal, Dec. 9-10, 2008, in Chapel Hill, provided a National Toxicology Program forum open to public comment, regarding whether these metals should be listed in the 12th Report on Carcinogens.
- Samuel Wilson, M.D., and Jerry Yakel, Ph.D., senior scientists at NIEHS, were named 2008 Fellows by the American Association for the Advancement of Sciences at their annual meeting in December.
- The NTP Board of Scientific Counselors met Nov. 20, 2008, and voted to accept three working group reports on the establishment of new criteria for future NTP immunotoxicology, reproductive, and developmental studies. The criteria are similar to those used with the agency's cancer studies which are based on five levels of evidence ranging from clear evidence to no evidence, and inadequate study.
- Recipients of the Outstanding New Environmental Scientists (ONES) awards presented their work at a meeting Dec. 11, 2008, in Rodbell Auditorium. The awards recognize and seek to advance the careers of outstanding junior investigators.
- The National Toxicology Program Board of Scientific Counselors will meet Feb. 24, 2009, to peer review five draft substance profiles for candidate substances under consideration for listing in the 12th Report on Carcinogens.
- Off-campus satellite office space for NIEHS has been consolidated from two buildings in locations further from the main campus to one, three-story structure, the Keystone Building, about a mile away. This improves the access of these staff members to each other and makes their commute to the main campus shorter. The move was accomplished between late November and mid January.
- Samuel Wilson, M.D., who has served as Acting Director for NIEHS and NTP over past months, has elected to return to laboratory work fulltime, in the DNA Repair and Nucleic Acid Enzymology group within the Laboratory of Structural Biology of our Division of Intramural Research. His work on behalf of the Institute in a very challenging time is deeply appreciated by the new Director and the entire Institute staff.

Legislative Report

FY 2009 Appropriations

A chart showing the FY 2009 appropriations numbers is shown on the following page.

During December Senate and House members and staff negotiated the marks for the nine appropriations bills that have not been passed by the Congress. When those numbers are released, they will be considered by the House and Senate as though they were Conference Committee marks. Indications are that the Labor, HHS Subcommittee mark for NIH is between the House and Senate marks—a plus for NIEHS.

National Institute of Environmental Health Sciences
11 July 2008
FY 2009 Marks

	<u>FY 2007 Comparable</u>	<u>FY 2008 CAA Mark + Supp</u>	<u>FY 2009 President's Request</u>	<u>FY 2009 House Subcommittee</u>	<u>FY 2009 Senate Subcommittee</u>
NIEHS ¹	\$ 642,002,000	\$ 645,669,000	\$ 642,875,000	\$ 664,980,000	\$ 660,767,000
NIH ¹	\$ 28,899,887,000	\$ 29,379,524,000 ²	\$ 29,229,524,000 ⁷	\$30,379,524,000	\$ 30,254,524,000
Common Fund ¹	\$ 483,000,000	\$ 498,244,000	\$ 533,877,000	\$ 544,146,000	\$ 568,119,000
Superfund ³	\$ 79,117,000	\$ 77,546,000	\$ 77,546,000	\$ 78,074,000 ⁵	
DOE Training ⁴	\$ 9,819,369	\$ 9,909,000		\$ 10,000,000	

¹Funding authorized by the Public Health Service Act and falls under the jurisdiction of the Labor, HHS, ED and related Agencies Appropriations Subcommittees. The FY 2008 marks include \$3,416,000 for NIEHS, \$150,000,000 for NIH, and \$2,636,000 for the Common Fund from the first FY 2008 supplemental to be used for scientific research.

²This amount includes \$295,000,000 for the Global AIDS Fund transfer and \$983,000 for the HHS Autism Transfer.

³Funding authorized by the Superfund Amendments and Reauthorization Act of 1986 and falls under the jurisdiction of the Interior, Environment and Related Agencies Appropriations Subcommittees. Neither the House nor the Senate Report designates the amount of funding for the NIEHS Superfund Research or Worker Training Programs. In the FY 2009 Congressional Justification sent to the Congress by OMB, the FY 2008 CAA Mark and FY 2009 President's Request for research are \$ 49,629,000 and for worker training \$27,917,000.

⁴The Department of Energy (DOE) is required by Congressional mandate to provide training to people who cleanup DOE sites. Rather than establish its own program, DOE transfers the funding to NIEHS to manage the DOE Worker Training Program. The Energy and Water Appropriations Subcommittees have jurisdiction.

⁵The House Subcommittee earmarked the \$528,000 increase for the NIEHS Superfund Worker Training Program. I have not seen any documents confirming this number.

⁶I have not seen any documents confirming this number.

⁷This amount includes \$300,000,000 for Global AIDS.

FY 2009 Stimulus

The House Appropriations Committee released a summary of their stimulus bill. It provides \$2 billion for NIH, including \$1.5 billion for expanding good jobs in biomedical research to study diseases such as Alzheimer's, Parkinson's, cancer and heart disease, and \$500 million to implement the repair and improvement strategic plan developed by the NIH for its campuses. The bill has been passed by the House and has been under consideration by the Senate as of this writing.

FY 2010 Appropriations

The President's Request for FY 2010 is expected to go to the Hill in April.

Breast Cancer – S. 579 and H.R. 1157

In September, the House Energy and Commerce Committee marked up and reported H.R. 1157. The amended bill was passed by the Congress in September and signed by the President on 8 Oct 2008. (P.L. 110-354)

The new law establishes the Interagency Breast Cancer and Environmental Research Coordinating Committee (Committee) to coordinate information on existing activities related to breast cancer and environmental research and make recommendations to the National Institutes of Health and other Federal Agencies on how to improve existing research programs. While the focus of the Coordinating Committee is breast cancer and environmental research, this focus should not be interpreted in a way that would preclude the Committee from taking into account the important role of basic and other cancer research in advancing understanding of the etiology of breast cancer.

The Committee shall (1) share and coordinate information on existing research activities and make recommendations to the National Institutes of Health (NIH) and other Federal agencies by identifying research gaps and scientific opportunities to improve existing research programs related to the environmental causes of breast cancer; (2) develop a comprehensive strategy and advise the NIH and other Federal agencies in the solicitation of proposals for collaborative, multidisciplinary research, including proposals to evaluate environmental and genomic factors that may be related to the etiology of breast cancer; (3) develop a summary of advances in breast cancer research supported or conducted by Federal agencies relevant to the diagnosis, prevention, and treatment of cancer and other diseases and disorders; and (4) make recommendations to the Secretary regarding any appropriate changes to research activities, to ensure that federal research activities are free of duplication of effort, how to increase the involvement of patient advocacy and community organizations, how to best disseminate information on breast cancer research progress, and how to expand partnerships between public and private entities to expand collaborative, cross-cutting research.

Membership includes seven federal officials (CDC, NIH, DoD, and others as deemed appropriate), six members who are scientists, physicians, or other health professionals, and six members of the public who represent people with breast cancer.

In addition, P.L. 110-354 authorizes \$40 million to carry out research to evaluate environmental and genomic factors that may be related to the etiology of breast cancer. (This is an authorization only and does not mean that the funds have been appropriated.) Research on other forms of cancer may be included when doing so may advance research in breast cancer or advance research in other forms of cancer.

NIH/Building 1 Information and Updates

NIH Governance

Biennial Report of the Director

NIH released the first Biennial Report of the Director in January 2009 and it provides an integrated portrait of NIH research activities. The report makes it easier for Congress, advocates and patient groups, and the general public to understand the many programs within the agency.

The report contains an assessment of the state of biomedical and behavioral research organized by disease category, investigative approach, or resource. To ensure that the document reflects the work of all 27 Institutes and Centers (ICs), 15 trans-NIH teams gathered, reviewed, and organized information into a standardized format. The report is available at

<http://report.nih.gov/biennialreport/>

Peer Review

In March 2008, NIH released the final report on the new peer review process, which identified the most significant challenges and proposed recommendations that would enhance the peer review system. The areas of implementation are organized into the following four priority areas: 1) Engage the best reviewers; 2) Improve the quality and transparency of review; 3) ensure balanced and fair reviews across scientific fields and reduce administrative burden; and 4) continuous evaluation of peer review. The NIH will begin implementing changes in the Fiscal Year 2010 funding cycle. Investigators submitting applications in January 2009 and later should be aware of the following new policies. Changes to the peer review process for both reviewers and applicants can be found at: <http://enhancing-peer-review.nih.gov/>

New Investigator Policies

New Investigator policies, stemming from the NIH Enhancing Peer Review Initiative have been revised along with a new policy announcement. Under this new policy, the NIH intends to support New Investigators at success rates comparable to those for established investigators submitting new applications. Early Stage Investigators (ESIs), should comprise a majority of the New Investigators supported. In addition, New Investigator applications will be clustered during review whenever possible. <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-09-013.html>

Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI)

The Division of Program Coordination, Planning, and Strategic Initiatives (pronounced Dee-Poughkeepsie) has now been established as mandated in the 2006 NIH Reform Act. It encompasses the former OPASI (the Office of Program Analysis and Strategic Initiatives) as well as the Offices of AIDS Research, Disease Prevention, Behavioral and Social Sciences Research,

and the Office of Research on Women's Health. DPCPSI has lead roles for the NIH Roadmap, the NIH Council of Councils, and the Research, Condition and Disease Categorization project, and for facilitating and reporting on trans-NIH collaborations.

Research, Condition and Disease Categorization (RCDC)

In January 2009, the National Institutes of Health (NIH) launched the public Research, Condition, and Disease Categorization (RCDC) website: <http://report.nih.gov/rcdc/> RCDC begins a new process for providing detailed funding information for 215 major areas using knowledge management and computerized, standardized tools. The RCDC process was initiated at the request of Congress to provide consistent and transparent NIH research funding information. For the first time, project listings and the associated dollar amounts are available to the public. By clicking on each of the categories, the user can access full project listings for that category and view, print, or download the detailed report. The RCDC webpage is part of the RePORT website (see paragraph about RePORT below).

Transformative R01 Program

The NIH announced a new Roadmap program, titled the Transformative R01 Program (T-R01s), designed to attract the development of highly creative, paradigm-busting, "out-of-the-box" projects. Special areas of Highlighted Need have been identified for the program. The NIH recognizes that new paradigms are needed in these areas and will strongly encourage research that addresses these needs. The broad topics highlighted in this endeavor include:

- Understanding and Facilitating Human Behavior Change
- Complex 3-D Tissue Models
- Functional Variation in Mitochondria in Human Disease
- Transition from Acute to Chronic Pain
- Formulation of Novel Protein Capture Reagents
- Providing an Evidence Base for Pharmacogenomics

Pioneer Award Program

The NIH Director's Pioneer Award Program is a unique aspect of the NIH Roadmap for Medical Research, a high-risk research initiative of Research Teams of the Future. Pioneer Awards are designed to support individual scientists of exceptional creativity who propose pioneering – and possibly transforming approaches - to major challenges in biomedical and behavioral research. The recent award recipients, the 2009 request for applications and program announcement can all be found at this website: <http://nihroadmap.nih.gov/pioneer/index.aspx>

Office of Extramural Research (OER)

NIH Offers New Research Portfolio On-Line Reporting Tool (RePORT)

The NIH Office of Extramural Research (OER) has posted its new website and on-line reporting tool, RePORT. This is valuable tool for those searching for data and analyses of NIH research programs and activities, as well as links to CRISP, a glossary of reporting terminology, FAQs, and more. RePORT also provides a detailed listing of funding information, called Research, Condition, and Disease Categorization (RCDC), as mentioned above in the DPCPSI section. More about the RePORT website can be found at <http://report.nih.gov/>

Adobe Application Forms

Transition to Adobe officially began on December 5, 2008, when NIH updated more than 500 active Funding Opportunity Announcements (FOAs) with Adobe-based application packages and closed their PureEdge predecessors. The new Adobe forms are required for submission for most receipt dates in January and beyond. This transition means submissions will be electronic and integrated with Grant.gov's centralized website.

Maintaining Objectivity in Research – Conflict of Interest Information

The NIH, in collaboration with grantee institutions and with its employees, works to maintain the highest standard of objectivity in all its research endeavors. Correspondingly, various measures have been instituted to address extramural Financial Conflicts of Interest (FCOI) issues quickly and carefully. An expanded FAQ document has been posted about the relevant regulations on the OER website - <http://grants.nih.gov/grants/policy/coifaq.htm> - and a Web-based Tutorial will soon be published, which will thoroughly review the roles and responsibilities of the NIH, awardee Institutions, and Investigators. Also, a Web-based reporting and tracking tool that provides a central place for collection of all FCOI reports received across the NIH will improve monitoring of FCOI reports.

Medical Research with Animals: For Researchers and Institutions

A NIH website has been developed to support NIH-funded scientists using animal models. The url for this website is: http://grants.nih.gov/grants/policy/air/researchers_institutions.htm The new website is a resource for researchers, and institutions that use animals in NIH-supported science; it provides guidance for preparedness and crisis management by researchers and institutions; and it also provides quick access to funding opportunities focused on animals in research, resources to assist with grant writing, and training and education for animal care and use, models, and science and ethics. A sister site designed for the general public is set to be launched in the near future.

Other Items of Interest

Science of Eliminating Health Disparities

December 2008 - The NIH Summit: The Science of Eliminating Health Disparities explored how the integration of Science, Practice, and Policy furthered this research agenda. More than 4000 scientists, practitioners, and community members showcased the collective contribution of the NIH in the development of new knowledge in the science of eliminating health disparities. <http://nexus.od.nih.gov/nexus/nexus.aspx?ID=185&Month=12&Year=2008>

NIH Research Radio and Podcasts

NIH Research Radio features in-depth interviews with NIH scientists and grantees discussing the latest research findings, educational campaigns, consumer-orientated features, and results from Consensus and State of the Science conferences. Each program runs approximately 30 minutes. NIH Research Radio, which is currently ranked among iTunes Top 100 Medicine Podcasts, is updated every other Friday. Go to <http://www.nih.gov/news/radio/nihpodcast.htm> to subscribe to the RSS news feed or listen to podcast via your computer. For more information, contact Joseph Balintfy at 301-496-7246.